

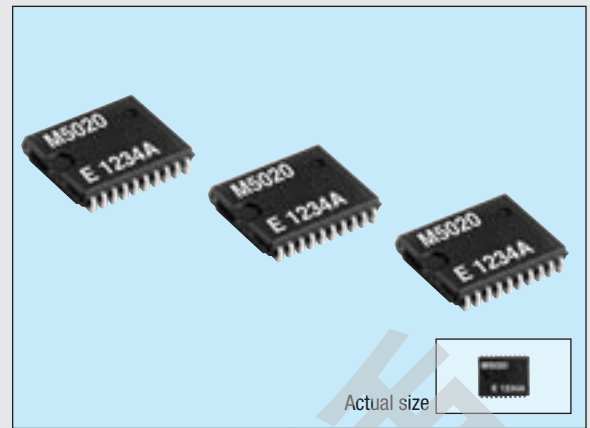
32 kHz + PLL OSCILLATOR

# MG-5020JE

Product number (please refer to page 4)

**Q33M22JExxxx00**

- Built-in 32.768 kHz crystal unit allows adjustment-free.
- 32.768 kHz clock frequency output.
- 48.005120MHz PLL oscillation frequency output.
- Support low current consumption mode by deviding power supply of 32.768 kHz and PLL oscillation cuircuit.
- Supply voltage : 32.768 kHz oscillation 1.8 V - 3.6 V, PLL oscillation 2.7 V - 3.6 V.
- SOJ-20pin package.
- Available for lead (Pb)-free soldering.
- Available for lead (Pb)-free terminal.



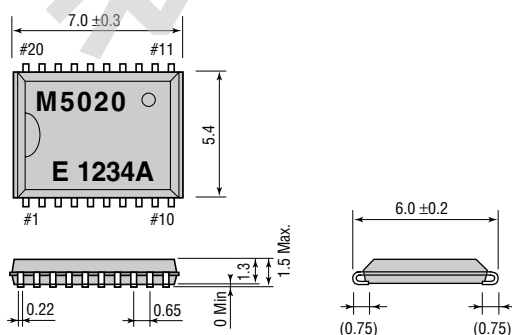
## Specifications (characteristics)

Item	Symbol	Specifications	Remarks	
Output frequency range	f <sub>o</sub>	32.768 kHz	Out 32 k pin	
	f <sub>OUT</sub>	48.005120 MHz	OUT pin	
Power source voltage	Max. supply voltage	V <sub>DD</sub> -GND	-0.3 V to +4.5 V	
	Operating voltage	V <sub>DD</sub>	2.7 V to 3.6 V	PLL Output
		V <sub>BK</sub>	1.8 V to 3.6 V	32 kHz Output
Temperature range	Storage temperature	T <sub>STG</sub>	-55 °C to +125 °C	Stored as bare product after unpacking
	Operating temperature	T <sub>OPR</sub>	-40 °C to +85 °C	No condensation
Frequency stability	Δf/o	5 ±23 x 10 <sup>-6</sup>	T <sub>a</sub> = +25 °C, V <sub>DD</sub> = 3.0 V	
Current consumption 1 (PLL Stopping)	I <sub>OP1</sub>	3 μA	V <sub>DD</sub> = 1.8 V to 3.6 V, PWD = GND, OUT 32 k = no load condition	
Current consumption 2 (PLL Working)	I <sub>OPP</sub>	15 mA	V <sub>DD</sub> = 2.7 V to 3.6 V, PWD = "H", OUT = no load condition	
Duty	t <sub>w</sub> / t	40 % to 60 %	V <sub>th</sub> = 50 % V <sub>DD</sub>	
"H" output voltage 1	V <sub>OH</sub>	V <sub>DD</sub> -0.4 V Min.	I <sub>OH</sub> = 100 μA (OUT 32 kHz), 4.0 mA (OUT)	
"L" output voltage 1	V <sub>OL</sub>	0.4 V Max.	I <sub>OL</sub> = -100 μA (OUT 32 kHz), -4.0 mA (OUT)	
condition (fan out)	C <sub>L</sub>	15 pF Max.	OUT 32 k pin, OUT pin	
"H" input voltage 1	V <sub>IH</sub>	0.8 V <sub>DD</sub> to V <sub>DD</sub> +0.2	PWD pin	
"L" input voltage 1	V <sub>IL</sub>	GND -0.2 to 0.2 V <sub>DD</sub>		
Output rise time	t <sub>r</sub>	5.0 ns Max.	20 % → 80 % V <sub>DD</sub> , OUT pin	
Output fall time	t <sub>f</sub>	5.0 ns Max.	80 % → 20 % V <sub>DD</sub> , OUT pin	
Jitter	p <sub>j</sub>	150 ps	V <sub>DD</sub> = 2.7 V to 3.6 V	
Oscillation start up time	t <sub>STA1</sub>	3 s Max.	T <sub>a</sub> = +25 °C, V <sub>DD</sub> = 0 → 1.8 V to 3.6 V	
	t <sub>STAP</sub>	0.1 s	V <sub>DD</sub> = 0 → 2.7 V to 3.6 V, PWD = LOW → High	
Aging	f <sub>a</sub>	±5 x 10 <sup>-6</sup> / year Max.	T <sub>a</sub> = +25 °C, V <sub>DD</sub> = 3.0 V, First year	

1 Please contact us for inquiries about the available frequency.

## External dimensions

(Unit: mm)



No.	Pin terminal	Function	No.	Pin terminal	Function
1	OUT 32 k	32.768 kHz output	20	N.C.	OPEN
2	N.C.	OPEN	19	N.C.	OPEN
3	V <sub>DD1</sub>	32.768 kHz oscillation power supply	18	N.C.	OPEN
4	GND	GND	17	N.C.	OPEN
5	N.C.	OPEN	16	N.C.	OPEN
6	N.C.	OPEN	15	N.C.	OPEN
7	PWD	Control PLL oscillation (STOP)	14	N.C.	OPEN
8	N.C.	OPEN	13	N.C.	OPEN
9	N.C.	OPEN	12	N.C.	OPEN
10	V <sub>DD2</sub>	supply	11	OUT	PLL output

Metal may be exposed on the top or bottom of this product. This won't affect any quality, reliability or electrical spec.